

REMARKS

Pending claims 6, 8-10, 19, 21-24 and 49-54 have been rejected under 35 USC §103 over Agostino in view of Parikh. Pending claims 34-37 have been rejected under 35 USC §103 over Parikh in view of Agostino. Claims 6, 8-10, 19, 21-24, 34-37 and 49-54 remain pending. Claims 6, 19, 34 and 49 have been amended.

Reconsideration of the rejection is respectfully requested, it is believed that the Office Action has misconstrued applicable portions of the Agostino and Parikh reference.

The Applicant's disclosure relates to photodefinable layers, such as for example photoresist. More particularly it relates to photodefinable layers in which the photodefinable layer may be converted into an insulative layer. For example, as described within the specification one such type of photodefinable material is plasma polymerized methylsilane (PPMS). Upon exposure to electro-magnetic radiation, the exposed portions of the PPMS layer may be converted to an insulative layer (such as for example the photo-oxidized siloxane PPMSO).

Parikh references such PPMS photodefinable layers and conversion to the insulative PPMSO with reference to the embodiments of the Figs. 4-5 of Parikh. It is noted that Agostino however does not teach or suggest photodefinable layers that are converted to insulative films but rather relates to the traditional types of photoresist known at the time. [Agostino Cols. 2-4]

Independent Claim 6

It is noted that the Office Action asserts that Agostino teaches converting the photodefinable layer 2 to an insulative material through exposure to radiation 10. [Office Action p. 2] However as noted above, Agostino merely uses traditional resists techniques in which exposed portions of the resist are not converted to insulative materials.

As noted in the claim, a feature is formed on the substrate “by converting selected portions of the photodefinable layer to an insulative material through exposure to electro-magnetic radiation ” (the non-exposed portions being used as a mask to form the feature). The Office Action asserts that Agostino teaches such feature, however, as noted above Agostino is not related to such types of resist and only Parikh discloses resists that are converted to insulators.

Further it is noted that after the masking steps an insulative layer is formed from “the non-exposed portions of the photo-definable layer which remain after the positive masking scheme” and this is accomplished by the non-exposed portions of said photo definable layer which “are then subsequently converted to the insulative layer through exposure through exposure to further electro-magnetic radiation.” The Office Action asserts that Parikh teaches with relation to Figs. 4A-4C such further exposure that is subsequent to the masking operations. However, it is respectfully asserted that Parikh does not teach such subsequent exposure after the masking steps of the previously non-exposed portions, but rather Parikh merely teaches removing the non-exposed portions of PPMS (“The etch pattern in layer 418 is developed by removing the unexposed PPMS portio of the layer, resulting in a hard mask having trench pattern 424”). The only conversion to an insulative film in Parikh is a conversion of the portions of PPMS exposed in the original masking step to form PPMSO.

There is no suggestion in Parikh to keep the non-exposed portion of PPMS of Parikh on the wafer. There is also no suggestion to provide a second subsequent exposure after the first masking exposure is performed to convert that originally non-exposed portion of PPMS of Parikh to an insulative layer.

As such it is respectfully asserted that independent claim 6 and all claims that depend therefrom are patentably distinct from the either of the cited references singularly or in combination.

Independent Claim 19

It is noted that Claim 19 has been amended to include dependent claim 24. As now claimed, the patterned insulative layer comprises “non-exposed portions of said photo-definable layer that were converted into additional insulative material after formation of said patterned insulative layer.” As mentioned above, there is no suggestion to keep the PPMS of Parikh on the wafer or to subsequently convert the non-exposed PPMS layer to an insulative material after the original patterning.

As such it is respectfully asserted that independent claim 19 and all claims that depend therefrom are patentably distinct from the either of the cited references singularly or in combination.

Independent Claim 34

It is respectfully noted that in claim 34 an interconnect is formed between a first conductive layer and a second conductive layer. Moreover, the photo-definable layer that may be converted to an insulative material is used in such a way that the non-exposed portions of the photo-definable mask are used for at least two purposes: “using non-exposed portions of said photo-definable layer as a mask to form a pattern within said insulative layer” and “by using non-exposed portions of said photo-definable layer as a sacrificial mask in etching said first conductive layer.” It is respectfully noted that in the cited references there is no suggestion to use the same mask layer for etching both an insulative layer and the conductive layer. The Office Action cites Parikh, however, it is noted that the film stacks of Parikh are used to connect a conductive substrate to the second conductive layer 242. There is no teaching or suggestion to etch either of these materials with a masking step (the substrate is not etched and the second conductive layer is an inlaid conductive layer).

As such it is respectfully asserted that independent claim 6 and all claims that depend therefrom are patentably distinct from the either of the cited references singularly or in combination.

Independent Claim 49

It is noted that Claim 49 has been amended to include dependent claim 54. As now claimed, “said insulative layer comprises non-exposed portions of said photo-definable layer subsequently converted into additional insulative material.” As mentioned above, there is no suggestion to keep the PPMS of Parikh on the wafer or to subsequently convert the non-exposed PPMS layer to an insulative material after the original patterning.

As such it is respectfully asserted that independent claim 49 and all claims that depend therefrom are patentably distinct from the either of the cited references singularly or in combination.

CONCLUSION

In view of the foregoing, it is submitted that the claims are in condition for allowance. Accordingly, favorable reconsideration and Notice of Allowance are courteously solicited.

The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Should any fees under 37 CFR 1.16-1.21 be required for any reason relating to the enclosed materials, including any additional fee for an extension of time, the Commissioner is authorized to deduct such fees from O'Keefe, Egan & Peterman Deposit Account No. 10-1205/MTIP:003D1.

Respectfully submitted,



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